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AMENDMENTS TO THE CLAIMS:

Kindly amend claims 1, 22, 23, and 39, as follows:

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Listing of claims:

1. (currently amended) An iterative carrier phase tracking decoding system comprising:
 - a buffer for buffering a block of symbols;
 - a serial turbo decoder for providing, during an iteration p , estimates s_k^p of one or more of the buffered symbols, r_k^p , and, ~~optionally~~, having a capability to provide one or more reliability metrics R_k^p , for the one or more estimates, and, after a prescribed number of iterations, estimates of underlying source bits;
 - a tracking loop module configured, during ^{the} an iteration p , to (a) determine one or more residuals z_k^p , between the one or more buffered symbols, r_k^p , and the corresponding one or more symbol estimates, s_k^p ; (b) ~~optionally~~ weight the residuals with corresponding reliability metrics, R_k^p ; and (c) determine one or more derotation phases θ_k^p responsive to one or more of the weighted or unweighted residuals;
 - a symbol derotator for derotating, during ^{the} an iteration p , one or more of the buffered symbols, r_k^p , using the one or more derotation phases, θ_k^p , and storing one or more of the derotated symbols, t_k^p , back in the buffer; and
 - a controller for directing the system to perform one or more iterations.
2. (original) The system of claim 1 further comprising a delay element for compensating at least in part for delay through the serial turbo decoder and the tracking loop module.
3. (original) The system of claim 1 wherein the serial turbo decoder comprises a series combination of a inner SISO, a de-interleaver, an output SISO, and an interleaver, wherein the inner SISO has an a priori input coupled to the output of the interleaver.
4. (original) The system of claim 3 wherein the inner and outer SISOs are soft output decoders.

5. (original) The system of claim 4 wherein the decoders are log-MAP decoders. *soft output a*
6. (original) The system of claim 3 wherein the symbol estimates are provided by the inner SISO of the serial turbo decoder.
7. (original) The system of claim 3 wherein the symbol estimates are derived from the output of the interleaver of the serial turbo decoder.
8. (original) The system of claim 7 wherein the symbol estimates are derived by passing the output of the interleaver through an encoder and channel symbol mapper that is configured to generate a code that the inner SISO is capable of decoding.
9. (original) The system of claim 1 wherein one or more of the buffered symbols r_k^p are derotated only during selected iterations.
10. (original) The system of claim 1 wherein one or more of the buffered symbols r_k^p are derotated after a prescribed number of iterations.
11. (original) The system of claim 1 wherein one or more of the buffered symbols r_k^p are derotated only during an initial number of iterations.
12. (original) The system of claim 1 wherein the tracking loop module is configured to determine one or more of the derotation phases θ_i^p in accordance with the following equation:

$$\theta_i^p = \sum_{j=i-W/2}^{j=i+W/2} z_j^p \cdot w_j$$

where $\sum_{j=i-W/2}^{j=i+W/2} w_j = 1$, W is the size of a window, in terms of number of symbols; z_j^p is a residual derived from a comparison of a buffered symbol r_j^p with a corresponding estimate of that symbol s_j^p ; and w_j is the weight assigned to the j th residual z_j^p .

13. (original) The system of claim 12 wherein the weights w_j follow a time-domain description of a predefined phase-noise mask.

14. (original) The system of claim 1 wherein the tracking loop module is configured to determine one or more of the derotation phases θ_i^p in accordance with the following expression:

$$\theta_i^p = \frac{\sum_{j=i-W/2}^{j=i+W/2} z_j^p \cdot w_j \cdot R_j^p}{\sum_{j=i-W/2}^{j=i+W/2} w_j \cdot R_j^p}$$

where W is the size of a window, in terms of number of symbols; z_j^p is a residual derived from a comparison of a buffered symbol r_j^p with a corresponding estimate of the symbol s_j^p ; w_j is the weight assigned to the j th residual z_j^p ; and R_j^p is a reliability metric for a symbol estimate s_j^p .

15. (original) The system of claim 1 wherein the tracking loop module is configured to determine one or more derotation phases θ_k^p in accordance with the following equation:

$$\theta_k^p = \sum_{i=1}^N a_i \cdot \theta_{k-i}^p + \sum_{i=0}^{M-1} b_i \cdot R_{k-i}^p \cdot z_{k-i}^p$$

where θ_k^p is the derotation phase for the k th symbol during the p th iteration, θ_{k-i}^p represents the derotation phase for the $(k-i)$ th symbol during the p th iteration, a_i is a coefficient applied to θ_{k-i}^p , z_{k-i}^p is a residual derived from a comparison of a symbol r_{k-i}^p with an estimate s_{k-i}^p of that symbol, R_{k-i}^p is the reliability metric for the estimate of the $(k-i)$ th symbol during the p th iteration, b_i is a coefficient applied to $R_{k-i}^p \cdot z_{k-i}^p$, and M and N are non-negative integers.

16. (original) The system of claim 1 wherein one or more residuals z_k^p are phase residuals e_k^p .

17. (original) The system of any of claim 1 wherein one or more residuals z_k^p are orthogonal component residuals y_k^p representing the components of r_k^p orthogonal to s_k^p .

18. (original) A receiver including the system of claim 1.

19. (original) A communications device including the receiver of claim 18.

20. (original) A set-top box comprising the communications device of claim 19.
21. (original) The system of claim 1 wherein the symbol derotator is a modulator.
22. (currently amended) An iterative carrier phase tracking decoding system comprising:
buffer means for buffering a block of symbols;
serial turbo decoding means for providing, during an iteration p , one or more estimates s_k^p of one or more of the buffered symbols r_k^p , and, ~~optionally~~, having a capability to provide one or more reliability metrics R_k^p , for the one or more estimates, and, after a prescribed number of iterations, estimates of underlying source bits;
tracking loop means for, during an ^{the} iteration p , (a) determining one or more residuals z_k^p between one or more of the buffered symbols, r_k^p and one or more corresponding symbol estimates, s_k^p ; (b) ~~optionally~~ weighting the one or more residuals with one or more corresponding reliability metrics, R_k^p ; and (c) determining one or more derotation phases θ_k^p , responsive to one or more of the weighted or unweighted residuals;
symbol derotation means for derotating, during an ^{the} iteration p , one or more of the buffered symbols, r_k^p , using one or more derotation phases, θ_k^p , and storing one or more derotated symbols, t_k^p , back in the buffer; and
control means for directing the system to perform one or more iterations.
23. (currently amended) A method of performing iterative decoding, comprising the following steps:
providing one or more estimates s_k^p of a block of buffered symbols r_k^p ;
~~optionally~~ providing one or more reliability metrics R_k^p for corresponding one or more estimates;
determining one or more residuals z_k^p between one or more buffered symbols r_k^p and one or more symbol estimates s_k^p ;
~~optionally~~ weighting one or more residuals z_k^p with one or more reliability metrics R_k^p ;
determining one or more derotation phases θ_k^p responsive to one or more of the weighted or unweighted residuals;

derotating one or more buffered symbols r_k^p using one or more derotation phases θ_k^p ;
buffering one or more derotated symbols t_k^p ;
if a prescribed number of iterations has not been completed, performing another iteration
beginning with the first providing step; and
after a prescribed number of iterations has been completed, providing estimates of
underlying source bits.

24. (original) The method of claim 23 further comprising derotating one or more buffered
symbols r_k^p only during selected iterations.

25. (original) The method of claim 23 further comprising derotating one or more buffered
symbols r_k^p after a prescribed number of iterations.

26. (original) The method of claim 23 further comprising derotating one or more buffered
symbols r_k^p only during an initial number of iterations.

27. (original) The method of claim 23 further comprising determining one or more derotation
phases θ_i^p in accordance with the following equation:

$$\theta_i^p = \sum_{j=i-W/2}^{j=i+W/2} z_j^p \cdot w_j$$

where $\sum_{j=i-W/2}^{j=i+W/2} w_j = 1$, W is the size of a window, in terms of number of symbols; z_j^p is a residual
derived from a comparison of a buffered symbol r_j^p with a corresponding estimate of that symbol
 s_j^p ; and w_j is the weight assigned to the j th residual z_j^p .

28. (original) The method of claim 27 wherein the weights w_j follow a time-domain
description of a predefined phase-noise mask.

29. (original) The method of claim 23 further comprising determining one or more derotation
phases θ_i^p in accordance with the following expression:

$$\theta_i^p = \frac{\sum_{j=i-W/2}^{j=i+W/2} z_j^p \cdot w_j \cdot R_j^p}{\sum_{j=i-W/2}^{j=i+W/2} w_j \cdot R_j^p}$$

where W is the size of a window, in terms of number of symbols; z_j^p is a residual derived from a comparison of a buffered symbol r_j^p with a corresponding estimate of that symbol s_j^p ; w_j is the weight assigned to the j th residual z_j^p ; and R_j^p is a reliability metric for the symbol estimate s_j^p .

30. (original) The method of claim 23 further comprising determining one or more derotation phases θ_k^p in accordance with the following equation:

$$\theta_k^p = \sum_{i=1}^N a_i \cdot \theta_{k-i}^p + \sum_{i=0}^{M-1} b_i \cdot R_{k-i}^p \cdot z_{k-i}^p$$

where θ_k^p is the derotation phase for the k th symbol determined during the p th iteration, θ_{k-i}^p represents the derotation phase for the $(k-i)$ th symbol during the p th iteration, a_i is a coefficient applied to θ_{k-i}^p , z_{k-i}^p is a residual derived from a comparison of a symbol r_{k-i}^p with an estimate s_{k-i}^p of that symbol, R_{k-i}^p is the reliability metric for the estimate of the $(k-i)$ th symbol during the p th iteration, b_i is a coefficient applied to $R_{k-i}^p \cdot z_{k-i}^p$, and M and N are non-negative integers.

31. (original) The method of claim 23 wherein one or more residuals z_k^p are phase residuals e_k^p .

32. (original) The method of claim 23 wherein one or more residuals z_k^p are orthogonal component residuals y_k^p representing the components of one or more of the buffered symbols r_k^p orthogonal to corresponding one or more estimates s_k^p .

33. (original) A computer readable medium tangibly embodying the steps of any of the methods of claims 23-32.

34. (original) The medium of claim 33 which is a memory.

35. (original) Circuitry embodying the steps of any of the methods of claims 23-32.

36. (original) The circuitry of claim 35 in a decoder.
37. (original) A synthesized logic circuit which comprises the circuitry of claim 36.
38. (original) An integrated circuit which comprises the circuitry of claim 36.
39. (currently amended) A method of performing iterative decoding, comprising the following steps:
- a step of providing one or more estimates s_k^p of one or more buffered symbols r_k^p ;
 - a step of optionally providing one or more reliability metrics R_k^p for one or more estimates;
 - a step of determining one or more residuals z_k^p between one or more buffered symbols r_k^p and corresponding one or more symbol estimates s_k^p ;
 - a step of optionally weighting one or more residuals z_k^p with one or more corresponding reliability metrics R_k^p ;
 - a step of determining one or more derotation phases θ_k^p responsive to one or more of the weighted or unweighted residuals;
 - a step of derotating one or more buffered symbols r_k^p using one or more derotation phases θ_k^p ;
 - a step of buffering one or more derotated symbols t_k^p ;
 - if a prescribed number of iterations has not been completed, a step of performing another iteration beginning with the first providing step; and
 - after a prescribed number of iterations has been completed, a step of providing estimates of underlying source bits.